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ABSTRACT

This booklet is intended to help mainstreamed mentally retarded, emotionally disturbed, or learning disabled high school students acquire a basic understanding of the responsibilities and working conditions of grain farming and to practice basic math skills necessary in the occupation. The first section provides a brief introduction to the occupation by focusing upon those job tasks of a grain farmer with which the student is likely to be familiar. The next two sections deal with the work environment of the typical grain farmer and the training, education, and experience needed for the occupation. Exercises addressing basic math skills used by grain farmers are provided. Various suggestions are listed for students interested in further exploring the occupation of grain farmer. A glossary and answer sheet conclude the booklet. (MN)

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MATH on the job

Grain Farmer

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MATH ON THE JOB:

GRAIN FARMER

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MATH on the job

Grain Farmer

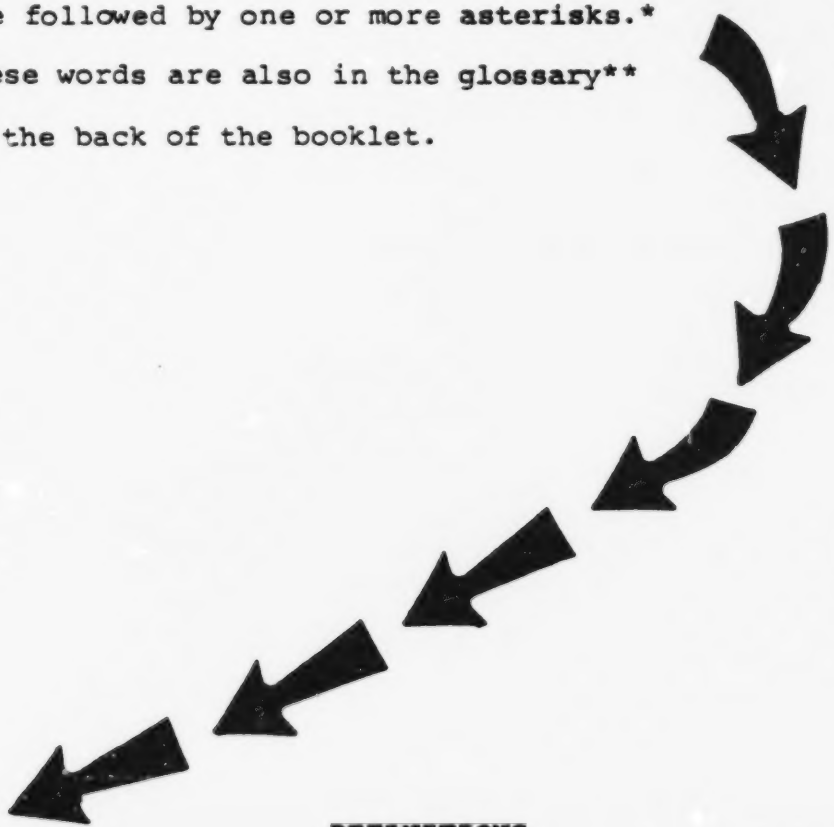
In this booklet, you can--

- find out what a grain farmer does
- see how a grain farmer uses math
- get a chance to use math as a grain farmer
- find out the types of things a grain farmer needs to know
- find out what courses, training, and experience you need to become a grain farmer

SPECIAL WORDS USED IN THIS BOOKLET

Workers in many jobs use special words or special meanings for words. Learning these words helps you to learn about a job.

You will find some of these special words in this booklet. When these words, and some hard words, are used for the first time, they are followed by one or more **asterisks.*** These words are also in the **glossary**** at the back of the booklet.



DEFINITIONS

*An asterisk (*) is a symbol that tells you to look at the bottom of the page for the meaning, or definition, of the word.

**A glossary is a list of words with their meanings.

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HAVE YOU EVER...

- watched a farmer plow a field to prepare it for planting crops?
- planted seeds or plants in a garden or in indoor pots?
- watched a farmer harvest crops such as wheat or corn?
- pulled weeds from a garden or flower bed?

Have you ever done any of these things? Then you have some idea about the work of a grain farmer. This booklet will help you learn about the work of grain farmers and how math is important to do the job.

WHAT DOES A GRAIN FARMER DO?

A grain farmer works on a farm and raises crops such as wheat, corn, and soybeans. How does a grain farmer do this? As a grain farmer, you--

- hire and supervise farm workers
- set up and operate farm machinery such as tractors, **plows***, and **harvesters****
- plant and harvest crops such as wheat, oats, soybeans, and corn
- sell the harvested crops

DEFINITIONS

*A plow is a machine that cuts, lifts, and turns over soil to prepare it for planting.

**A harvester is a machine used to gather in a crop.

Grain farmers use math in their work every day. As a grain farmer, you--

- count, add, subtract, multiply, and divide
- use whole numbers, decimals and fractions
- keep records of how much it costs to operate the farm
- buy supplies, equipment, and machinery
- sell farm products such as wheat, corn, soybeans, hay, and oats
- keep records of what and how much the farm produces

A grain farmer uses math to figure out earnings.

EXAMPLE

The difference between the selling price of farm products and the total cost to produce them is the grain farmer's profit. This profit is also called earnings.

Grain farmers sometimes want to know their profit for one bushel. The profit is calculated by subtracting the cost of producing a bushel from the selling price of the bushel. If oats sell for $3 per bushel and cost $2 per bushel to produce, what is the profit per bushel?

$$\$3 - \$2 = \$1$$

The profit per bushel is $1.

NOW YOU TRY IT

Practice Exercise A

1. Corn is selling for $4.00 per bushel and it costs $3.50 per bushel to produce. What is the profit per bushel?

2. Soybeans sell for $6.00 per bushel. They cost $5.53 per bushel to produce. What is the profit per bushel?

3. Hay sells for $45.00 per ton. It costs $37.00 per ton to produce. What is the profit per ton?

4. One grain farmer's profit per bushel of corn is $.85. What will be the <u>total</u> earnings if 100 bushels are sold?

5. The profit per bushel of wheat is $1.50. What are the total earnings when 20 bushels are sold?

A grain farmer uses math to estimate total production.

EXAMPLE

A farmer has planted 285 acres of wheat. Based on past harvests, the farmer expects a yield of 95 bushels per acre. Estimate the farmer's total production.

To estimate, round 285 and 95 to the nearest hundred. In this example, round 285 to 300. Round 95 to 100. Multiply the rounded numbers.

$$300 \times 100 = 30{,}000$$

The estimate of the farmer's total production is 30,000 bushels of wheat.

NOW YOU TRY IT

Practice Exercise B

In the chart below, you are given the number of acres of land and the expected yield per acre for several different crops. Estimate the total production for each crop listed.

	Crop	Numbers of Acres of Land	Estimated Yield Per Acre (Bushels)	Estimated Total Production
6.	Wheat	732	160	?
7.	Soybeans	373	172	?
8.	Corn	528	112	?
9.	Oats	498	145	?
10.	Wheat	132	155	?

A grain farmer uses math to estimate the payment for total production.

EXAMPLE

A farmer expects to harvest a total production of about 30,000 bushels of wheat. The farmer will be paid $6.18 for each bushel. Estimate the payment for the farmer's total production.

To estimate, you would round $6.18 to the nearest whole dollar. In this example, round $6.18 to $6.00. Multiply the estimated total production by the estimated amount paid per bushel.

30,000 x $6.00 = $180,000.00

The estimate of the payment for the farmer's total production is $180,000.00.

NOW YOU TRY IT

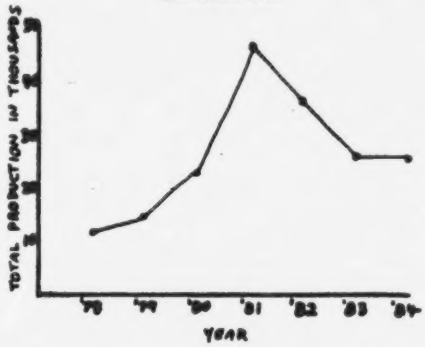
Practice Exercise C

In the chart below, you are given the estimated total production and the amount paid per bushel for several different crops. Estimate the payment for the total production for each crop listed.

	Crop	Estimated Total Production	Amount Paid Per Bushel	Estimated Payment For Total Production
11.	corn	20,000	$ 5.17	?
12.	soybeans	12,000	$ 1.15	?
13.	corn	5,000	$ .98	?
14.	oats	35,000	$ 2.35	?
15.	wheat	25,000	$ 7.62	?

A grain farmer uses math to read production charts.

EXAMPLE

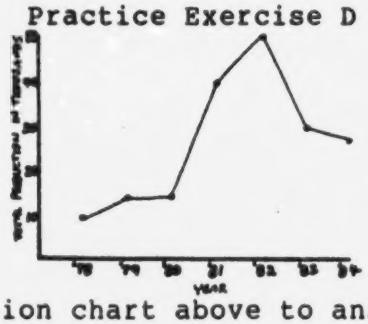


The graph above is a production chart. This graph charts the total production for each year from 1978 through 1984.

During what year was the total production the highest? To find the answer, you would look for the highest point on the graph. In this example, the highest point was in 1981.

NOW YOU TRY IT

Practice Exercise D



Use the production chart above to answer questions 16-20.

16. In what year was the total production the highest?

17. In what year was the total production the lowest?

18. What was the total production in 1981? in 1983?

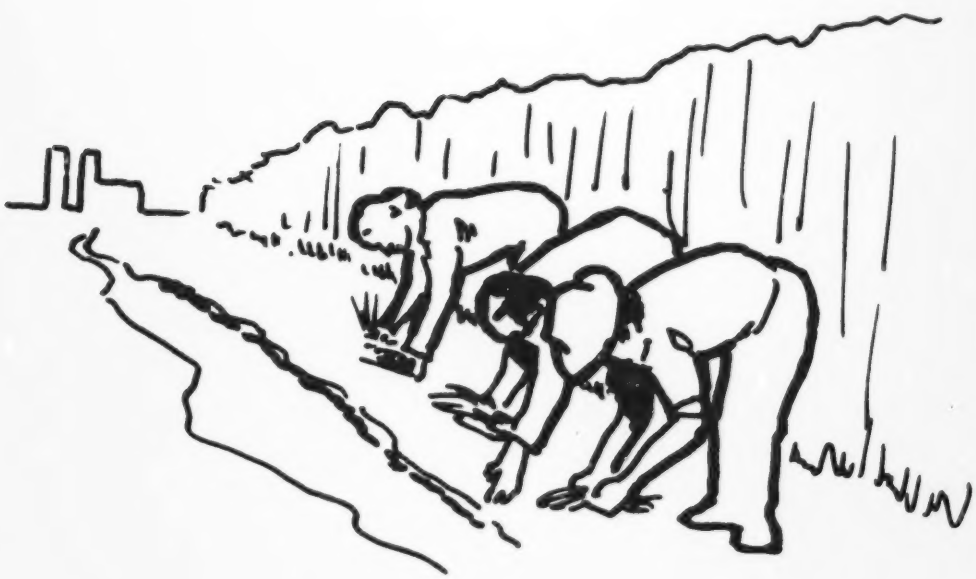
19. During what two years was the total production the same?

20. Between what two consecutive years did the total production increase the most?

WHERE DOES A GRAIN FARMER WORK?

As a grain farmer, you will work on a farm where crops such as wheat, corn, and soybeans are grown. The farm could be large or small. The work will be the same. You will plant and harvest grain products.

As a grain farmer, you will work with other farm workers as a team to plant and harvest crops.



Grain farmers use special types of equipment to perform their work. As a grain farmer, you use--

- hand tools such as hammers, saws, and wrenches to maintain and repair farm buildings and machinery
- tractors to pull or operate other farm machinery
- trucks to haul farm products or supplies
- cultivators to loosen soil around growing plants
- seed drills to drill holes in the soil and plant seed in each hole
- grain **combines*** to harvest or gather ripe grain crops

DEFINITION

*A <u>combine</u> is a machine used to harvest ripe grain crops. A combine cuts the grain from its stem, loosens the grain, and cleans the grain.

IF YOU ARE INTERESTED IN

THE WORK OF A GRAIN FARMER

AND WOULD LIKE TO KNOW MORE,

READ ON

WHAT TRAINING, EDUCATION, AND EXPERIENCE DO YOU NEED TO BECOME A GRAIN FARMER?

What do you think? Would you like to be a grain farmer? If you would, there are some things you should know.

To get a job as a grain farmer, you need to know about such things as--

- weather
- supply and demand for farm products
- accounting methods
- new farming **techniques***
- plant and animal diseases and how to treat them

The best way to learn these things is to enter a vocational education program at your high school.

DEFINITION

*A technique is a way or method of doing something.

Farm land, machinery, and equipment are expensive. It may be difficult for you to become a grain farmer if you are not a member of a farm family. However, you could get a job as a farm laborer, farm equipment operator, or farm manager. You could help an experienced grain farmer and be trained on the job.

Taking every chance to learn new skills and tasks will help you do a better job. Good math skills will also help you perform your work as a grain farmer.

DO YOU WANT TO DO MORE GRAIN FARMER'S MATH?

Practice Exercise E

21. One farmer made $6 profit per bushel on the sale of 14-1/2 bushels. What was the total earnings?

22. The total earnings on the sale of 50 bushels of oats was $200. What was the profit per bushel?

23. The total earnings on the sale of 7-1/2 bushels was $10.50. What was the profit per bushel?

24. When 122 bushels of wheat were sold, the total earnings were $1,110.20. What was the profit per bushel?

Practice Exercise F

25. A farmer planted 375 acres of corn. The farmer expects a yield of 125 bushels per acre. Estimate the farmer's total production.

26. A farmer planted 617 acres of soybeans. The farmer expects a yield of 160 bushels per acre. Estimate the farmer's total production.

Complete the chart below.

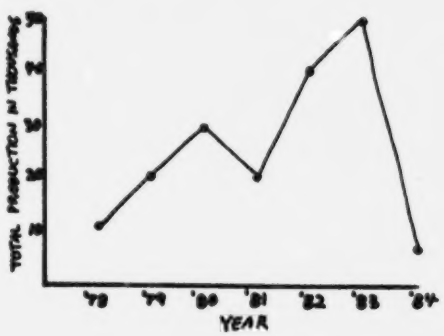
	Crop	Numbers of Acres of Land	Estimated Yield Per Acre (Bushels)	Estimated Total Production
27.	Oats	151	98	?
28.	Wheat	249	62	?

Practice Exercise G

In the chart below, you are given the estimated total production and the amount paid per bushel for several different crops. Estimate the payment for the total production for each crop listed.

	Crop	Estimated Total Production	Amount Paid Per Bushel	Estimated Payment For Total Production
29.	corn	15,000	$ 4.57	?
30.	cats	10,000	$ 6.72	?
31.	wheat	42,000	$ .98	?
32.	soybeans	20,000	$ 7.62	?

Practice Exercise H



Use the production chart above to answer the questions below.

33. During what year was the total production the highest?

34. During what year was the total production the lowest?

35. What was the total production in 1981? In 1982?

36. Between what two consecutive years did the total production increase the most?

DO YOU WANT TO EXPLORE SOME MORE?

1. Check to see if your school offers vocational training in agriculture. If such training is offered, contact the instructor and arrange to visit a class. Talk to some of the students in the class. Find out the types of classes they are taking and why they want to be farmers.

2. Visit a farm supply store. Examine the items that are for sale. Observe a worker in the store. Talk to the person you have observed. Find out how that person provides services to farmers. What services do they provide? Would you like to work in a farm supply store or would you rather be a farmer?

3. Visit a greenhouse. Talk to greenhouse workers and ask about the work they do. Is the work of a greenhouse worker similar to the work of a farmer? How?

4. Are you interested in other jobs which are similar to that of the grain farmer?

   - Dairy farmers breed, care for, and milk cows.
   - Fruit farmers plant and cultivate fruit trees such as apple, orange, and peach.
   - Vegetable farmers plant, care for, and harvest vegetables such as carrots, tomatoes, radishes, lettuce, and celery.
   - Cattle ranchers breed and care for livestock that produce meat.
   - Poultry farmers breed and care for chickens, ducks, and turkeys.
   - Vine-fruit crop farmers plant and cultivate bushes and vines and harvest crops such as grapes, strawberries, and cranberries.

   You must have good math skills to do these jobs well. Most of these workers add, subtract, multiply, and divide on the job every day.

GLOSSARY

Asterisk (*): a mark that tells you to look at the bottom of the page for the meaning, or definition, of the word.

Combine: a machine used to harvest ripe grain crops. A combine cuts the grain from its stem, loosens the grain, and cleans the grain.

Glossary: a list of words with their meanings.

Harvester: a machine used to gather in a crop.

Plow: a machine that cuts, lifts, and turns over soil to prepare it for planting.

Technique: a way or method of doing something.

ANSWER SHEET

Practice Exercise A

1. $ .50
2. $ .47
3. $ 8.00
4. $85.00
5. $30.00

Practice Exercise B

6. 140,000
7. 80,000
8. 50,000
9. 50,000
10. 20,000

Practice Exercise C

11. 100,000.00
12. 12,000.00
13. 5,000.00
14. 70,000.00
15. 200,000.00

Practice Exercise D

16. 1982
17. 1978
18. 40,000; 30,000
19. 1979 and 1980
20. 1980 and 1981

Practice Exercise E

21. $87.00
22. $ 4.00
23. $ 1.40
24. $ 9.10

Practice Exercise F

25. 40,000
26. 120,000
27. 20,000
28. 20,000

Practice Exercise G

29. $ 75,000.00
30. $ 70,000.00
31. $ 42,000.00
32. $160,000.00

Practice Exercise H

33. 1983
34. 1984
35. 20,000; 40,000
36. 1981 and 1982